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Importance of Early Successional Forest for Wildlife in Southern New England

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Many bird species that require early successional forest are declining in the Northeast U.S. (King 2001) because such habitat is relatively rare and when they inhabit the more common mature forests or suburban areas they are less successful. The rarity of early successional forest can be attributed to the lack of agriculture (Litvaitis 1993) and the spread of urbanization, which causes habitat loss, fragmentation, and also degradation of the existing habitat (Dessecker 2001, Litvaitis 2001). Early successional forest is maintained by regular disturbance such as wind, fire, clear-cutting, flooding, and beaver (*Castor canadensis*) activity (DeGraaf 2003) which has been happening less frequently during the past 50 years. The natural disturbance creates habitat for some species, but intense fire suppression and strict forestry practices have reduced the frequency of early successional forests (Brawn 2001).

Bird species that will continue to decline without proper early successional habitat include ruffed grouse (*Bonasa umbellus*), blue jay (*Cyanocitta cristata*), chestnut-sided warbler (*Dendroica pensylvanica*), gray catbird (*Dumetella carolinensis*), field sparrow (*Spizella pusilla*), golden-winged warbler (*Vermivora chrysoptera*), eastern bluebird (*Sialia sialis*), common yellowthroat (*Geothypis trichas*), American redstart (*Setophaga ruticilla*), and black-throated blue warbler (*Dendroica caerulescens*) (Yahner 1984). Gamebirds such as ruffed grouse that were once abundant are currently facing critical declines. Ruffed grouse are a species of critical concern in Rhode Island because their populations have declined to the extent that grouse hunting is no longer allowed (Teft 1999). The decline is related to lack of required early successional habitat (Endrulat 2005) and even-aged deciduous stands which protect grouse from predators (Dessecker 2001). In the Midwest, ruffed grouse populations are not declining, which

could be related to early successional habitat being more available. There are more early successional forests, and also more aspen (*Populus sp*) dominated forests in the Midwest (McDonald 1998). In the Northeast, especially Rhode Island, grouse tend to be found in mature mixed deciduous forests, which is less preferred, because there are few aspen dominated forests (Fettinger 2002) and few early successional forests (Butler 2002).

For grouse to survive in the deciduous mixed forests, habitat management must be implemented to maintain the early successional forest habitat that grouse and other bird species require. Management options include types of silviculture such as clear-cutting, group-cutting, prescribed burning, or forest thinning, which promote ground cover (Haulton 2003). Allowing natural disturbance is another option that could be implemented.

Studies throughout the country have described management plans that have succeeded in restoring the prime habitat for early successional species. Bald eagles *(Haliaeetus leucocephalus)* were facing a similar decline in Oregon like ruffed grouse are in Rhode Island. Eagles prefer to roost in trees created by natural disturbances; however, lack of habitat disturbance prevented eagles from locating prime roost trees. The study concluded that prescribed burning, thinning, and seeding would provide the necessary roost trees crucial for the eagles (Dellasala 1998). Forest disturbance in Oregon and Washington also provided dead trees and logs that were critical for cavity-nesting species because the tree decay provided ideal nesting and roosting habitat (Bull 2001). Nuthatches (*Sitta sp*) and woodpeckers (*Picidae sp*) also benefited from the disturbance because an outbreak of insects occurred after the disturbance which provided food for the birds.

Scientists have tried to determine the best method to create and effectively manage early successional forest. Aspen dominated southern mixed oak (*Quercus sp*) stands in Pennsylvania were managed effectively for ruffed grouse by clear-cutting small (1 ha) forest patches (McDonald 1998). Such even-aged cutting also benefited populations of blue jay, eastern bluebird, gray catbird, and field sparrow in Pennsylvania (Yahner 1984). A grouse study conducted in Pennsylvania used short-rotation clear-cuts (1-ha) to create various-aged forest stands of mixed oak and aspen/scrub oak (*Q. Ilicifolia, Q. prinoides*). The control habitat consisted of unmanaged mature oak and aspen/scrub oak stands. The results showed higher densities of female grouse and broods in the experimental clear-cut habitat than in the unmanaged habitat (Scott 1998).

Size of clear cuts is a major concern for management plans. The size of the cut will naturally depend on the species managed for. For instance, wild cats use larger areas where cottontail rabbits are common because the rabbits range more widely (Livaitis 2001). Size requirements should be >10 ha in order to sustain species such as bobcats. Birds, however, require smaller patch sizes. One study suggests patch size for grouse should be 1-2 ha (Dessecker 2001), another states 1 ha is most suitable (McDonald 1998), and another suggests 0.8 ha is sufficient (DeGraaf 2003).

Frequency of disturbance is another concern for managers. One study suggests disturbance such as clear-cutting or prescribed burning should occur every 10-15 years (DeGraaf 2003), and another study states every 10 years should be sufficient (Dessecker 2001). Disturbances occurring at this frequency appear to provide the most suitable conditions for development of early successional forests and provide higher species

success rates. If managers wait much past this time range, the forests become too mature for early successional species.

Not all scientists use clear-cutting as a method for managing forests because managing early successional forest may harm those species utilizing mature forests. A study conducted in Missouri discovered that Kentucky warblers (*Oporornis formosus*) and worm-eating warblers (*Helmitheros vermivorus*) increased in abundance in response to even-aged forestry practices, but oven birds (*Seiurus aurocapillus*) decreased in abundance from this disturbance (Gram 2003). In Oregon and Washington, disturbances such as thinning or prescribed burns may have provided open canopies which increased the abundance of black rosy finch (*Leucosticte atrata*), but it also decreased the abundance of woodpeckers as cover disappeared. Disturbance such as prescribed burning increased the abundance of woodpeckers using ponderosa pine (*Pinus ponderosa*) but decreased the abundance of other woodpeckers depending on the coarse woody debris (Bull 2001).

Group-cutting is another method used to control early successional habitat. Early successional habitat is created in a harvested area that is similar in size to an even-aged cut stand. The resulting area leaves areas of mature forest as well as early successional forest, therefore species requiring either mature or early successional habitat will benefit (King 2001). Unfortunately, not all species will adapt to smaller group-cut areas. For example, yellow-breasted chat (*Icteria virens*), prairie warbler (*Dendroica discolor*), rufous-sided towee (*Pipilo erthrophthalmus*), blue-winged warbler (*Vermivora pinus*), brown thrasher (*Toxostoma rufum*), alder flycatcher (*Empidonax alnorum*), indigo bunting (*Passerina cyanea*), olive-sided flycatcher (*Contopus cooperi*), northern flicker

(*Colaptes auratus*), song sparrow (*Melospiza melodia*), and tree swallow (*Tachycineta bicolor*) were all found in clear-cut areas, but were absent in group selection areas because of the decrease in size of the early successional habitat (King 2001). Most of those species were considered species of special management concern in parts of their regions therefore it is especially important to provide habitat for those species and not destroy what little habitat they may have left.

As previously illustrated, management plans may affect habitat of bird species occupying mature forests therefore the management techniques must be carefully implemented to ensure survival of both early successional and mature forest bird species (Lent 1995). Careful consideration must be taken before plans are implemented to ensure survival of as many species as possible and public education and outreach programs should be established to change misguided perceptions of forest management practices.

I would recommend clear-cutting 1 ha patches in Arcadia State Forest to provide early successional habitat for species. Frequency of disturbance should occur every 10 years to ensure habitat quality for early successional dependent species. The Forestry Department can profit by selling the timber after it has been cut. The mature forest species will lose habitat, however, the number of clear-cut patches should not cause a decline in mature forest species. Arcadia is dominated by mature forests, and species depending on that forest will have large habitats remaining after clear-cuts occur. This way, both early successional and mature forest species will not decline.

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